

Detecting human CD34+ and CD34- hematopoietic stem and progenitor cells using a Sysmex automated hematology analyzer.

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In clinical medicine, particularly in the newly developing stem cell therapies required to support the practice of regenerative medicine, the measurement of both CD34+ and CD34- hematopoietic stem cells (HSC)/hematopoietic progenitor cells (HPC) is important in obtaining more accurate information about the total HSC/HPC content in various stem/progenitor cell sources. We report the results of an investigation into methods of detecting CD34+ and CD34- HSC/HPC using the immature information (IMI) channel incorporated into the Sysmex XE-2100 and SE-9000 automated hematology analyzers. In this study, CD34+ and CD34- HSC/HPC were separated by immunologic methods and quantified by flow cytometry (FACScan) and IMI channel analysis. In addition, CD34-/CD133+ HSC were prepared by a sequential antibody-based positive selection strategy. These cells appeared in the same area as CD34+ cells in the IMI channel of the automated hematology analyzer. These findings confirmed that an automated hematology analyzer can be used to measure both CD34+ and CD34- HSC. These results may explain the difference in HSC/HPC counts sometimes observed between the automated hematology analyzer and flow cytometric methods for CD34+ measurement. The results of this study demonstrated the potential of automated cell counting methods for measuring HSC content in cellular products for both research and clinical applications.

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